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SCIENTIFIC AFFAIRS  
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## INTERNATIONAL AFFAIRS

### CONFERENCE ON SUGGESTOPEDIA CONVENED IN BUDAPEST

Budapest NEPSZABADSAG in Hungarian 19 Sep 76 p 10

[Excerpts] Suggestopedia attempts to achieve activation of the unused reserves of the brain. To achieve this, it makes use of hypnopedia, hypnosopedia which teaches during sleep and can be used only as an auxiliary form and, finally, suggestology. This method was devised and initiated by the Bulgarian researcher, Lozanov. It is being used in Moscow (and four other Soviet cities). Research on the method is being conducted in Ottawa, Khorkov and California. Initial attempts at using it are being made in Hungary as well.

An international conference on suggestology was convened in Budapest in late June. Professor Lozanov, one of the speakers, told the audience how his method happened to evolve. At the time, he was practicing psychotherapy at the Sofia clinic of neurology. He began his psychiatric and subsequent pedagogical research to rehabilitate persons suffering from concussion, brain damage and loss of memory. At the recommendation of the Bulgarian Academy of Sciences, a Suggestological Scientific Research Center was established in Sofia. Here, partly for experimental purposes over 1,000 persons have participated in courses. At the same time teachers in suggestology are also being trained at the center. (For example the Maurice Thorez College of Foreign Languages of Moscow sent a series of language teachers to the center.)

According to Professor Lozanov, suggestology has three basic principles: It must provide an agreeable experience and relieve the student of excessive work; those taking part in the studies must participate fully at both conscious and subconscious levels; and finally, there is the principle of suggestive interactions which serve to activate the reserve potential of the students. The students are also relieved of the gripping anxiety which often occurs chiefly during language study by being assigned a role for the duration of the course. Each person is given a new name and life history and must act and speak in accordance with these during the course. The games consist of true-to-life type situations. For instance, they pretend that an international delegation is arriving which seeks lodging, food, drink, souvenirs and programs which are typical of our city, country and people.

All this takes place in a nontraditional environment: the teacher does not stand on a platform facing the students. Instead, people are generally seated comfortably in a circle. The room is quiet, soundproof and attractive.

Music is of special importance not only creating a desire to work, but also in shaping work. This music is also present in the form of singing, which is connected with role playing in suggestopedic teaching. Last but not least, the subject matter is special. In its compilation, pedagogical elements are interspersed with psychoterapeutic effects. The usual sequence "learning, practice, facility, fluent speech" is not adhered to. No separate grammar nor vocabulary are taught. From the beginning complete sentences are used in a conversational setting. Suggestology, Lozanov's system, unlike hypnopedia and other methods, is not a supplementary, but an independent method of teaching.

At present suggestology is used as a vehicle for language study in Hungary, too. However, what is really important is that the evolution of the suggestological teaching method is a device for teaching language. It would be a mistake to believe the the Lozanov method serves to teach language. It can also be used for this purpose, especially since the result, measured on the basis of lexical units, is easier to evaluate. According to Bulgarian experiences, a student learns 20 - 30 lexical units per day by traditional methods, but between 100 - 200 when working with suggestopedia.

Grade school children of Sofia were taught reading and mathematics by suggestology. They learned the material for the first 2 years in 4 to 5 months without any homework. Gymnasium students completed 4 years of material in 2 to 3 years, also without homework. At present 15 experimental schools in Bulgaria are using suggestology for teaching purposes. There are 15 schools of the same level being used as controls.

It is typical of suggestological teaching that it involves the entire personality of the student. It not only enriches his knowledge, but enhances his ability to work, his health and his mood.

Naturally Lozanov's method is no miracle device. It cannot be used for everything and it requires additional research and development. Nevertheless, in these hurried times which call for so much study, it is a method worthy of attention.

CSO: 2502

## CZECHOSLOVAKIA

### CZECHOSLOVAKS TO BE TRAINED AS COSMONAUTS

Prague ZEMEDLSKE NOVINY in Czech 21 Aug 76 p 2

[Article by Jaroslav Marsalek]

[Text] During his first visit in Prague, shortly after his legendary flight, YuriyGagarin told me that not much time would elapse before Czechoslovak people would also travel into space. Other Soviet cosmonauts spoke similarly. Now the takeoff of our citizens into space is in sight. At the last meeting of delegations of socialist countries participating in the INTERKOSMOS program, the Soviet delegation proposed to Czechoslovakia and seven other states represented that their citizens join crews of Soviet spaceships. The agreement opening space to international crews was ratified by signatures. By the end of the 1970's we will apparently know the name of the first Czechoslovak cosmonaut to undergo space baptism.

At present the basic training of cosmonauts for SOYUZ ships and SALYUT satellite stations takes 2 years. When the rocket ship currently being developed starts flying, specialists will travel to orbital stations as passengers after a short preparation.

#### From Fantasy to Every Day Reality

Twenty years ago the opening of the Atomic Institute at Dubna--which at the time was equipped with the most powerful accelerator--to foreign scientists caused a great stir in the West. The entire world was guarding the secrets of nuclear physics--and suddenly the Soviet government took such a step.

The majority of our nuclear specialists was schooled in Soviet nuclear laboratories. The United Institute of Nuclear Research at Dubna belongs equally to the CSSR as to the other participating socialist countries.

Our participation in the construction of nuclear power plants is just as natural. After bringing on line the first "atomic plant" we are building others. And a new industrial branch came into being in our country-- nuclear power plant engineering. A similar unexpected precipitous development can occur also in cosmonautics.

## The SALYUT Experiments

Interesting though meager information reaches us about the activity of the SALYUT 5 crew. But each experiment described in the daily press in a few lines has far-reaching consequences for the development of cosmic flight. And Czechoslovak cosmonauts will meet up with the results directly.

What, for example, is the meaning behind the announcement that the cosmonauts are evaluating in specially prepared tests the equipment of the spaceship, the functionality and comfortableness of work and resting places, means for physical fitness exercises, active rest and hygienic amenities.... On the basis of such tests Soviet engineers are then perfecting the interiors of satellite stations to best meet the exigencies of long-term stay of crews in space.

A small example: there is no "up" or "down" in a state of weightlessness, the cosmonauts can calmly sleep suspended from the "ceiling" like bats. In spite of this "the ceiling" is differentiated from "the floor" in the SALYUT by color—for better orientation and greater psychological security of the cosmonauts.

### Why Peacock-Eyes?

Each of us understands why physicians in the control center on earth monitor carefully the pulse and breathing of every crew member of remote control. Other medical experiments on board the SALYUT can also be readily understood: tests are being conducted mainly on various new devices to increase the tolerance of the effects of long-term weightlessness by the human organism.

But what purpose do the small viviparous peacock-eye aquarium fishes serve? The cosmonauts are attentively observing and filming a pair of peacock-eye fishes and especially their space-born progeny. This is only one of the many biological experiments conducted on board the station designed to reveal the secret of adaptability of the live organism to the state of weightlessness.

Biological experiments serve also mostly to safeguard the health of crew members and keep them in good condition. But the cultivation of some types of plants is the precursor of satellite "gardens" which would remove carbon dioxide from the atmosphere and make for a welcome addition to the cosmonaut's diet.

### Cosmic Metallurgy

Crew members of SALYUT 5 Volynov and Zalobov undertook a series of metallurgical experiments which already constitute the preparation for production in metallurgical workshops of satellites. Pellets have for centuries been



made by casting molten lead through screens from towers. In the course of flight lasting a few seconds lead in a weightless state turns into little balls. The SALYUT crew cast perfect spheres from a variety of metals.

The weightless state will also enable cosmic metallurgists to produce hollow spheres on a principle underlying the blowing of soap bubbles. Metal "bubbles," light and strong even in large sizes, will be suitable for use as ball bearings in giant helicopters, extensive radar stations, astronomical instruments and the like.

Alloys which cannot be produced on earth will be produced in orbiting workshops, as will metal foams which, while strong like stainless steel, will be so light that they will float on water like cork.

#### Desirable and Undesirable Crystals

Experiments on board the SALYUT involving the cultivation of crystals are interesting. On earth almost everything is affected by the omnipresent gravitation, from lightning during storms to building construction or glass-making. For this reason the growth of crystals from chemical elements also has its limits, which under conditions prevailing on earth cannot be exceeded.

Things are different on satellite stations. The absolute vacuum which makes possible the cultivation of superfine crystals can also be made use of there. In a weightless state crystals can be grown with an ideal atomic lattice or in the form of monocrystalline fibers (whiskers) of microscopic diameter and astonishing strength, as well as in the form of monocrystals from elements. Ruby needles from SALYUT 5 have a strength up to ten times greater than the ones made on earth.

On the other hand the making of optical glass under earth conditions encounters problems of crystallization of the melt on the walls of containers. In space, molten glass will always be free floating--the melt will assume the shape of a sphere. The grinding of the glass to optical lenses would be done on earth.

#### The Inviting Cosmos

On board the SALYUT 5, as on its three inhabited predecessors experiments were already carried out which can decisively accelerate the setting up of cosmic industrial workshops and laboratories. In the list of suitable products of cosmic "factories" we will find windows for nuclear reactors, glass from oxides of aluminum, hafnium, zirconium and titanium, parts from other materials which cannot be melted on earth because there are no containers which can withstand the heat from the melt.

The list contains also special electronic tubes, metal membranes several molecules thick, vaccines, new types of drugs.... many other things.

Orbital metallurgy will make use of a solar furnace, raw materials will be supplied in tablet form. Solar power plants will supply the "factories" with sufficient amounts of energy; vacuum, weightlessness and intensive cold are absolutely free.

Gravitation forces us to build massive buildings and machines, but satellite workshops will be light and rotating parts of machines can work with a small expenditure of force also without ball bearings because there is no friction.

#### They Already Serve Today

The setting up of orbiting industrial installations is probably nearer in the future than we think. But even the satellite stations of the SALYUT type are already of great economic importance. They serve primarily as observatories to study the earth's surface. They serve geologists, topographers, oceanologists, meteorologists and other specialists. They are of considerable usefulness also to farmers whom they supply with information about precipitation, the weather situation, the presence of pests, the ripening of crops, etc., over extensive areas.

Czechoslovak cosmonauts will surely find their place in the universe just as our people did successfully in nuclear research, in the Antarctic, in the technology of jet airplanes and in other most recent research fields on earth. But even in cosmonautics we are not complete newcomers: we participate in space research by means of automatic satellites in the INTERKOSMOS program.

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## HUNGARY

### CEMA CONFERENCE ON COMPUTERS HELD IN HUNGARY

Budapest VILAGGAZDASAG in Hungarian 28 Sep 76 p 3

[Text] The economic council of the Intergovernmental Committee on Computer Technology recently held its eighth session at Balatonfured. In discussing the agenda of the meeting, Laszlo Pal, department head of the National Technical Development Committee, said that the problem of specialization was among the first to be dealt with at the meeting. The delegations agreed that the fundamental questions of long-term multilateral specialization and cooperation must be worked out in the course of this year. The question of specialization has arisen at this time, because since it is no longer expedient for more than one country to develop and work on the same product, it is time to eliminate unnecessary duplication. Furthermore new products continue to appear on the market, and in planning for their manufacture, specialized production must be arranged for in a more modern way.

Although the first series of Unified Computer System machines will not have come full term till the early 1980's, they are already beginning to become obsolete. This why they must be replaced by a more developed, higher capacity second series. Its design has been completed and production of all members of the series will begin in the course of the present 5-year plan.

Hungary has opted for the further development of the R-10. The intermediate types, which are considerably more sophisticated and reliable than the first series, are appearing on the markets of the socialist countries in succession. The performance price indices of these machines are also better than those of the preceding series. Manufacture of the Hungarian R-12 will begin in the course of this year at the Videoton factory. The Soviet R-22 and R-33 as well as the Polish R-32 computers will soon be on the market.

Improvement of reliability is of particularly great importance in the case of electromechanical peripherals. Development of new systems was also a topic of discussion at the meeting of the economic council of the Intergovernmental Committee for Computer Technology. Cooperation in research and development has begun in both the area of data processing and that of automated process control. Development of software and activation were also on the agenda.

The intergovernmental committee set up two councils for the working out and development of user programs. Within the framework of the first of these the countries will develop program systems on the basis of a harmonized program. Thus, for example, they will work out the user programs needed for various kinds of enterprises; for control of production, material management, and wage accounting. Under the supervision of this council about 100 types of program packages will be compiled.

The other council will develop programs required for automating engineering work. They will put together programs pertinent to the work of construction, electrical, and mechanical engineering. The programs worked out on the basis of joint plans will be subjected to joint testing in practice [bevizsgalas]. The sum total of these tested programs will represent the joint so-called archives. Any of the member nations may have access to this collection. How this will be done will be determined on the basis of bilateral agreements.

The council also dealt with medium- and long-term development and the methodological and organizational problems of prediction. Finally the economic council of the Intergovernmental Committee for Computer Technology discussed the question of how it would be possible to acquire more rapidly and simply components needed for working out prototypes--components already worked out in the CEMA countries.

CSO: 2502

POLISH ACADEMY OF SCIENCES ACTIVITIES, PERSONNEL

Warsaw NAUKA POLSKA in Polish No 5, May 76 pp 127-137

[Text] Decorations and Jubilees

Academician of the Polish Academy of Sciences Henryk Jablonski, chairman of the State Council, received in July 1975 the title of foreign member of the Mongolian Academy of Sciences.

On 1 October 1975 during the celebration of the 30th anniversary of the University B. Bierut in Wroclaw, Prof Henryk Jablonski was granted the title of doctor of honoris causa in recognition of his outstanding achievements in the field of the contemporary history.

The General Assembly of the Academy of Sciences of the GDR has elected Academician of the Polish Academy of Sciences [PAN] Witold Hensel, foreign member of the Academy. The outstanding archeologist was moreover elected vice president of the International Union of Slavonic Archeology and of the International Slavonic Committee.

The title of academician of the Serbian Academy of Sciences and Arts was conferred on Corresponding Member of PAN Jan Mikusinski.

Prof Dr Wojciech Zielenkiewicz, director of the Institute of Physical Chemistry of PAN, was elected on 20 March 1975 corresponding member of the Academy of Sciences in Barcelona.

On 11 July 1975 a doctorate honoris causa was conferred upon Academician of PAN Manfred Lachs by the University of Southampton. Doctorates honoris causa were also conferred upon Prof M. Lachs by Howard University in Washington and by the University of Sofia. On 23 October 1975, in the United Nations, the medal of the "Outstanding Lawyer of the World" was conferred on Prof Manfred Lachs, president of the International Court of Justice.

In December 1975, the Association for the Promotion of Industrial Mechanics (GAMI), grouping French and Belgian scientists, elected Academician of PAN Jan Karczmarek as its honorary member and scientific secretary.

Academician of PAN Kazimierz Urbanik was elected in December 1975 as the first Polish mathematician, full member of this highest international organization in the field of probability theory, the International Statistical Institute.

Academician of the Polish Academy of Sciences Roman Kozlowski received a doctorate honoris causa from the University of Modena. The ceremony of conferring the diploma took place on 12 December 1975 during the celebration of the 800th anniversary of the University.

During the celebration of the 200th anniversary of the birth of the great French physicist Andre-Marie Ampere at the University of Lyon in June 1975, the promotion took place of Academician of PAN Jerzy Pniewski to a doctor of honoris causa.

Prof J. Brill received on 25 September 1975 the honorary membership of the Polish Society of Microbiologists and in June 1975 a golden diploma from the Academy of Agriculture in Wroclaw.

In October 1975 Academician of PAN, Aleksander Jablonski became a doctor honoris causa of the University of Gdansk.

Academician of PAN Wlodzimierz Kurylowicz received in October 1975 the title of a doctor honoris causa from the Academy of Medicine in Krakow. This Academy has also conferred on W. Kurylowicz the medal of N. Copernicus. Moreover W. Kurylowicz was also granted a commemorative medal of Gottfried Wilhelm Leibniz of the GDR Academy of Sciences.

Scientists of great merit for the development of Polish medicine, Academician of PAN Henryk Brokman, Academician of PAN Adam Gruca, and Academician of PAN Witold Zawadowski became doctors honoris causa of the Academy of Medicine in Warsaw. The ceremony took place on 16 May 1975.

On 16 December 1975 the Polish Society of Naturalists in Kopernik celebrated the 100th jubilee of its existence. At the jubilee session the diplomas of honorary members of the Society were conferred upon: Prof Dr Hanna Cieczottowa, corresponding member of PAN Wilhelmina Iwanowska, Academician of PAN Roman Kozlowski, Academician of PAN Edmund Malinowski, Academician of PAN Szczepan Peiniazek, Academician of PAN Kazimierz Smulikowski, Academician and President of PAN Wlodzimierz Trzebiatowski.

Academician of PAN Karol Borsuk and Academician of PAN Stanislaw Mazur have received honorary membership from the Polish Mathematical Society.

On 16 October 1975 Academician of PAN Leonard Sosnowski was elected vice president of the International Union of Pure and Applied Physics.

In September 1975 at the Congress of the International Union of Geodesy and Geophysics in Grenoble, Academician of PAN Zdzislaw Kaczmarek was elected president of the International Commission of Water Systems.

In August 1975 at the 18th General Assembly of the International Scientific Radio Union (URSI) in Lima, Academician of PAN Adam Smolinski was elected chairman of the Commission for Electronics for a period of 3 years. During a meeting of the Sixth European Microwave Conference Prof Adam Smolinski, participating in it as a member of the Board of European Microwave Conferences and representing the countries of Mid-Europe, was elected vice chairman of this Board.

The general meeting of the International Society of Surgeons, with its seat in Brussels, during the 26th World Congress in Edinburgh (13-20 September 1975) elected Academician of PAN Wiktor Bross, vice president of the 27th World Congress of Surgeons, which will be held in Tokyo in 1977.

Prof W. Bross accepted on the occasion of the 70th anniversary of the activity of the Polish Medical Society in Czestochowa the Wladyslaw Biegnanski commemorative medal.

Academician of PAN Tadeusz Krwawicz was elected member of the International Academy of Ophthalmology and a member of the Council of Foreign Members of the Scientific Institute of Oculistic Research in Venezuela.

At the World Meeting of Oculists in Paris Prof T. Krwawicz was elected member of the Presidium of Concilium Ophthalmologicum Universale.

On 18 September 1975 Corresponding Member of PAN Witold Rudowski was elected president of the International Federation of Surgical Colleges. The Federation was created in 1958 and at present it comprises 44 countries. The members of the federation include surgical societies, colleges, and academies of surgery. Through these societies the federation represents over 100,000 surgeons of the world. The federation holds its meetings annually and its main aims are the enhancement of surgery in the world, development of international cooperation in the field of surgery and the initiation and support of investigations in the selected fields of surgery in member countries. Until now the presidents of the federation were Sir Harry Platt (Great Britain), Prof Englebert Dumphy (United States), Sir John Bruce (Great Britain), and Prof Walter MacKenzie (Canada). The International Federation of Surgical Colleges as an organization is officially connected with the World Health Organization.

The Presidium of PAN, by its decision of 24 June 1975, conferred on 12 scientists in recognition of their outstanding scientific achievements the Nikolaj Kopernik medal of PAN. Medals presented on 18 December 1975 by President of the Academy, Academician of PAN Wlodzimierz Trzebiatowski, were received by Stefan Bialobok, Academician of PAN Karol Borsuk, Corresponding Member of PAN Jozef Hano, Prof Dr Wladyslaw Herman, Academician of PAN Aleksander Jablonski, Academician of PAN Julian Krzyzanowski, Academician of PAN Stanislaw Lorentz, Academician of PAN Henryk Lowmianski, Academician of PAN Dionizy Smolenski, Academician of PAN Henryk Szarski, and Prof Dr Olech Szczepski.

In August 1975 Academician of PAN Jerzy Kurylowicz received the medal "Merentibus" conferred on him by the Senate of the Jagiellonian University for outstanding services to Polish and world science.

The International Institute of Historic Castles located in the Netherlands instituted an honorary medal to celebrate the European Year of the Protection of Monuments. The first medals awarded this year were received by 20 persons from various countries, including two Polish scientists: Academician of PAN Stanislaw Lorentz and Prof Dr Alfred Majewski, inspector general of Historic Monuments in Poland.

The medal of the 30th anniversary of the Liberation of Czechoslovakia was conferred on Academician, President of PAN, Wlodzimierz Trzebiatowski, Academician, Scientific Secretary of PAN, Jan Kaczmarek, and Academician of PAN Wlodzimierz Kurylowicz.

On 13 October 1975 Prof J. Kurylowicz also received the golden badge "For Services to the Development of the Machine Industry."

On 31 July 1975 Academician of PAN Stefan Wegrzyn was awarded the medal "For Service to the Navy."

The European Prize for the Protection of Monuments was awarded in 1975 to Academician of PAN Jan Zachwatowicz. The ceremony of the award of the prize took place on 23 October 1975 in Amsterdam.

The Royal Society of New Zealand has awarded the Prize of Geophysics to Dr Slawomirowi Gibowicz, scientific worker of the Institute of Geophysics of PAN. Dr S. Gibowicz, who was the first Pole awarded the Scientific Prize of New Zealand, worked for 4 years in the Seismological Observatory of the Department of Scientific and Industrial Research in Wellington, carrying out scientific investigations on the mechanisms of earthquakes. These investigations concerned in particular the connection of physical properties of the seismic focus with tectonic conditions in seismic areas. New Zealand belongs to the highly seismic countries and has a very extensive network of seismic stations. The subject matter of investigations being carried out, viz, the connection between the seismic focus and tectonic conditions, is of great importance for knowing mechanisms governing geodynamic processes.

The State Council of the Polish People's Republic has awarded the Commander's Cross of Polonia Restituta to Academician of PAN Kazimierz Boratynski and to Corresponding Member, Secretary of the Department VI of Medical Sciences of PAN, Jan Karol Kostrzewski.

Prof K. Boratynski has also received the badge of the Ministry of Agriculture, of "Honored Agricultural Worker."

The president of the Republic of Italy has awarded the Commander's Cross of the Order for Services to the Republic of Italy to Academician of PAN Witold Hensel and to Academician of PAN Aleksander Gieysztor. The Officer's Cross of the same Order was received by Prof Dr Jozef Heinstejn, philologist from the University of Wroclaw.



Professor W. Hensel was also awarded by the Presidium of the Czechoslovak Academy of Sciences the Golden Medal of F. Palacky for services in the development of social sciences. The publishing house "Epoka" has awarded to Prof W. Hensel the Year's Prize for the overall work in the field of research in the formation of the Polish medieval society.

#### Agreements on Scientific Cooperation

From 27 to 30 October 1975 discussions were held in Moscow between delegations of the Department of Medical Sciences of PAN and USSR Academy of Medical Sciences concerning the scientific cooperation in the years from 1976 to 1980.

During these talks it was established that the Department of Medical Sciences of PAN and the USSR Academy of Medical Sciences will conduct joint research and coordinate it on the basis of the special subject matter plan comprising 16 problems, including among other things, the transplantation of organs and pathology and diseases of the nervous system. The scientific institutions carrying out joint research will work out and sign the working plans, in which they will define the subject and the form of cooperation, and the mutual obligations of parties and responsible executors.

The limit of exchange, not involving currency exchange, was established at 20 weeks annually for each of the parties for the realization of the research subject matter. Irrespective of the limit of the exchange, not involving currency exchange, both parties will receive scientists at the expense of the delegating party and invite scientists for the purpose of carrying out consultations, expertises, delivering lectures and taking part in scientific events.

In order to coordinate the current problems of cooperation, every second year there will be held meetings of the representatives of both parties. It was also considered expedient to organize working meetings of scientists carrying out research for the purpose of making a review of the work carried out.

The protocol on scientific cooperation between the Department of Medical Sciences of PAN and the USSR Academy of Medical Sciences was signed in Moscow on 29 October 1975 by Secretary of the Department of Medical Sciences of PAN, Corresponding Member of PAN Jan Kostrzewski, and Vice President of the USSR Academy of Medical Sciences, Corresponding Member V. V. Kovanov.

\* \* \*

In accordance with the agreement on Scientific Cooperation between PAN and the Academy of Sciences of the Mongolian People's Republic on 24-25 November 1975, talks were held in Ulan Bator between delegations of the two Academies concerning scientific cooperation for the years 1976-1980.

Both parties stressed with satisfaction the fulfillment of research tasks in the years 1974 and 1975 in the domain of the geographical-ethnographical investigations on the territory of the Mongolian People's Republic. These investigations will also be continued in the subsequent years in relation to the

following themes: "Investigations of the Structure of Typical Landscapes of the Central Part of the Mongolian People's Republic" and "The Social Structure of the Working Class in the Era of Socialism (as exemplified by the Polish People's Republic and Mongolian People's Republic)." The concrete programs, the aims of cooperation, and mutual obligations of the parties will be worked out by the interested institutes carrying out joint investigations.

To carry out joint scientific work, exchange of experiences, etc, both academies will exchange scientific workers on the basis of the exchange, not involving currency exchange, for a period of 10 weeks annually for each of the parties. Both academies will also invite scientists of the second party for participation in scientific events.

PAN and the Academy of Sciences of the Mongolian People's Republic have decided to jointly celebrate the 35th anniversary of the formation of the Polish People's Republic, the 55th anniversary of the establishment of the Mongolian People's Republic, and the 15th anniversary of the signing of the first agreement on scientific cooperation between the two academies by organizing the jubilee scientific meetings, exhibitions, and a series of lectures on achievements of the second party.

The Plan of Scientific Cooperation between PAN and Academy of Sciences of the Mongolian People's Republic for the years 1976-1980 was signed in Ulan Bator on 25 November 1976 [sic] by First Deputy Scientific Secretary of PAN, Academician of PAN Tadeusz Orlowski and Vice President of the Academy of Sciences of the Mongolian People's Republic [AN MRL], Academician of AN MRL Shagdaryn Bir.

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From 12 to 14 January 1976 a solemn meeting was held in Berlin between delegations of PAN and the GDR Academy of Sciences, in connection with the celebration of the 20th anniversary of the signing of the first agreement on scientific cooperation and in order to carry out talks on the subject of cooperation between the two academies in the years 1976-1980.

In summing up the cooperation, both parties stressed that the principles of the long-term planning of scientific investigations introduced in the years 1971-1975 have created the proper basis for the further enhancement of the level and development of scientific cooperation between the two academies. The coordinated main directions of the cooperation constitute the basis of the program of joint research of PAN and the Academy of Sciences of the GDR in the years 1976-1980. Thus the cooperation between the academies will be concentrated on the following problems: solid-state physics and investigation of materials; molecular biology and medicine; mathematics, cybernetics and computing technology; chemistry; social sciences; construction of scientific equipment; protection and shaping of environment.

In the framework of main directions the scientific and organizational framework will continue to be provided by the commissions of experts whose obligations will include among other things the determination of new research tasks and definition of the aims of cooperation.

Both academies will also support the cooperation of the units concerned in the field of patent and license protection, exchange of equipment and documentation, scientific information, publications and exchange of experiences in the domain of planning and coordination of scientific research in the two academies. The range and forms of this cooperation will be coordinated by the corresponding partners.

To realize the scientific cooperation both parties have agreed on a limit of exchange, not involving foreign currency, in the amount of 530 weeks annually [sic], of which 160 weeks will be realized in the form of long-term visits. Both academies are likewise providing for possibilities of the employment in their scientific units of workers of the other party on a contractual basis.

On the proposal of a commission of experts in the field of solid-state physics and investigation of materials, distinctions and prizes were awarded for the first time for the outstanding jointly achieved results in scientific cooperation in the years 1971-1975.

The protocol on scientific cooperation between PAN and the Academy of Sciences of the GDR for the years 1976-1980 was signed on 14 January 1976 in Berlin by President of PAN, Academician of PAN Włodzimierz Trzebiatowski and Scientific Secretary of PAN, Academician Jan Kaczmarek, and President of the Academy of Sciences of GDR, Herman Klare, and General Secretary of the Academy of Sciences of the GDR, Corresponding Member Carl Grote.

#### Visits of Polish Scientists Abroad

Corresponding Member of PAN Bogdan Baranowski attended on 25 May 1975 the Fourth International Conference on High Pressures in Moscow.

Vice President of PAN, Academician of PAN Witold Nowacki and Academician of PAN Władysław Fiszdón participated in the International Symposium on "Trends of Applications of Pure Mathematics to Mechanics," which was held on 26-31 May 1975 in Lecce (Italy). At the Symposium Prof W. Nowacki delivered a report entitled "Some Geometric Properties of a System of First Order Nonlinear Partial Differential Equations."

Corresponding Member of PAN Piotr Zaremba took part in a meeting on the subject of the UNESCO program on "Man and the Biosphere," which was held on 1-7 June 1975 in Paris.

At the Fourth Congress on "Texture and Properties of Materials," which was held on 2-4 June 1975 in Cambridge, Corresponding Member of PAN Wojciech Truszkowski delivered a report entitled "The Development of Rolling Texture in Polycrystalline Silver Within a Wide Range of Deformation."

Corresponding Member of PAN Janusz Haman took part in the Fifth International Conference of the Society of Terrain Vehicles at which he delivered a report on "The Influence of Tractor Wheel Velocity on the Conditions of Plant Growing."

Academician of PAN Kornel Gibinski took part in a Worldwide Congress on "Smoking and Health," organized on 2-5 June 1975 in New York by WHO and American Cancer Society.

At the invitation of the Serbian Academy of Sciences and Arts, Corresponding Member of PAN Kazimierz Smulikowski traveled to Skoplje to deliver a series of lectures at the local university.

Vice President of PAN, Academician of PAN Szczepan A. Pieniazek and Secretary of the Department of Agriculture and Forestry Sciences of PAN, Academician of PAN Bohdan Dobrzanski took part in a solemn session on the occasion of the 250th anniversary of the USSR Academy of Sciences, which was organized in Moscow on 8-13 June 1975 by the All-Union Academy of Agricultural Sciences.

At the Gordon Conference on Catalysis, held on 16-20 June 1975, Corresponding Member of PAN Jerzy Haber delivered a report on "Mechanism of Selective Oxidation of Hydrocarbons."

Academician of PAN Tadeusz Urbanski took part in a meeting of WHO held on 11-14 June 1975 in Versailles on the subject of diseases induced by parasites.

Academician of PAN Arkadiusz Piekara traveled on 11 June 1975 to Nobosibirsk where he took part in the Fourth Vavilov Conference on Nonlinear Optics (12-14 June) and in the Second Symposium on Physics of Gaseous Lasers (16-19 June).

Academician of PAN Kazimierz Kumaniecki took part in the general assembly of the international academic union which was held on 15-21 June 1975 in Munich.

Within the framework of the program of cultural and scientific exchanges between PRL and the Republic of France, Academician of PAN Adam Bielanski traveled on 20 June 1975 to France and visited scientific centers in Marseilles and Toulouse where he carried on consultations and delivered lectures on "Physicochemical and Catalytic Properties of the  $V_2O_5$ - $MoO_3$  Systems" and "Bulk and Surface Properties of  $MgO$ - $CoO$  Solid Solutions."

Academician of PAN, Vice President of PAN Szczepan A. Pieniazek participated in the Symposium on Cultivation of *Prunus avium* and *Cerasus* which was held on 26-27 June 1975 in Klyustendil (Bulgaria).

Prof Franciszek Ryszka from the Institute of History of PAN traveled on 26 June 1975 to Bonn where he delivered at the University a lecture entitled ... "[Figure illegible] Jahre Volkspolens. Bilans der Entwicklung in politologischer Sicht."

Corresponding Member of PAN Wladyslaw Findeisen participated in the Conference on "Integrated Systems Control in the Steel Industry" organized 30 June-2 July 1975 in Laxenburg (Austria) by the International Institute of Systems Applied Analysis.

Corresponding Member of PAN Zbigniew Jedlinski and Prof Eligia Kusmierz-Turska from the Department of Polymers of PAN took part in the Fourth Conference on "Modified Polymers, Preparation and Properties," which was held in Bratislava on 1-4 July 1975.

Academician of PAN Jan Kielanowski traveled on 6 July 1975 to England in order to receive the title of doctor honoris causa conferred upon him by the University of Edinburgh.

Corresponding Member of PAN Antoni Horst participated in the International Congress of Pathological Physiology which was held in Prague on 8-11 July 1975 and at which Horst delivered a lecture entitled "Molecular Foundations of Pathophysiology."

Corresponding Member of PAN Jerzy Kostrowicki participated in a meeting of FAO experts held on 22-24 July 1975 in Geneva on the subject of methodology of the planning of rural areas.

Corresponding Member of PAN Lech Wojtczak took part in the 10th International Congress of the European Federation of Biochemical Societies FEBS, at which he delivered a lecture entitled "Transport of Phospholipidic Acid Between Membranes." The scientist also participated in the meeting of the FEBS Council, representing the Polish Biochemical Society (Paris, 19-29 July 1975).

Academician of PAN, Chairman of the National Committee of the URSI, Adam Smolinski, and Prof Stefan Hahn, traveled on 5 August to Lima to take part in the General Assembly of the International Scientific Radio Union.

Corresponding Member of PAN Zygmunt Kowalczyk, Corresponding Member of PAN Roman Teisseyre, Docent Weneda Dobaczewska, and Docent Wojciech Krzeminski, from the Institute of Geophysics of PAN, participated in the General Assembly of the International Union of Geodesy and Geophysics which was held in Grenoble on 20-28 August 1975.

Corresponding Member of PAN Jan Karol Kostrzewski took part in the Meeting of the National School of Public Health, held on 24-26 August 1975 in Rennes, at which he presided over proceedings of the Section of Epidemiology.

Director of the Institute of Legal Sciences of PAN, Prof Adam Lopatka, participated in the Worldwide Congress of the International Society of Philosophy of Law and Social Philosophy, held on 24-29 August 1975 in Saint Louis, at which Professor Lopatka delivered a lecture entitled "The Socialist Model of the Social Equality of Men and Its Realization in Poland."

Academician of PAN Maciej Nalecz, Corresponding Member of PAN Roman Kulikowski, and Director of the Institute of Organization and Control of PAN and MNSzWiT [expansion unknown], Prof Andrzej Straszak, took part in the Congress IFAC 75, held in Boston on 25-29 August 1975.

Academician of PAN Boguslawa Jezowska-Trzebiatowska, Academician of PAN Adam Bielanski, Academician of PAN Jan Michalski, and Corresponding Member of PAN

Antoni Rutkowski participated in the 28th Conference of the International Union of Pure and Applied Chemistry IUPAC, held on 9-11 September 1975 in Madrid.

Corresponding Member of PAN Henryk Cholaj took part in the Eighth International Congress of Cooperative Sciences, at which he delivered a lecture entitled "The Concentration of the Cooperative Movement in Poland (Darmstadt, 9-12 September 1975).

Deputy Secretary of the Department of Technical Sciences of PAN, Prof Dr Witold Gutkowski, participated in the Second International Congress on Space Structure, held on 15-19 in Guildford.

Academician of PAN Kazimierz Kuratowski took part in the Scientific Symposium in Honor of Pythagoras, held in Athens on 7-14 September 1975.

Corresponding Member Jerzy Kostrowicki took part in the Scientific Conference of the Commission of Typology of Agriculture of the International Geographic Union, held on 22-28 September 1975 in Paris. The scientist also participated in the Meeting of the International Working Group for the Planning of Rural Areas.

Academician of PAN Leonard Sosnowski, Corresponding Member of PAN Jozef Werle, and Docent Adam Kujawski from the Institute of Physics of PAN, took part in the General Meeting of the International Union of Pure and Applied Physics IUPAC [ought to be IUPAP], held on 24-29 September 1975 in Munich.

Corresponding Member of PAN Adam Urbanek presided at a meeting of a group of experts, relating to the cooperation in the field of biological, medical and agricultural sciences between PAN and Academy of Sciences of GDR, which was held on 1-3 October 1975 in Berlin.

Corresponding Member of PAN Bogdan Baranowski traveled on 4 October 1975 to Birmingham to take part in the International Meeting on Hydrogen in Metals, at which he delivered a lecture entitled "Absorption of Hydrogen in Ni-Mn Alloys and Formation of Manganese Hydride."

Corresponding Member of PAN, Secretary of the Department of Social Sciences of PAN Wladyslaw Markiewicz, and Prof Dr Wlodzimierz Wesolowski from the Institute of Philosophy and Sociology of PAN traveled on 5 October 1975 to take part in a Meeting of National Representatives of the Council of Social Sciences of UNESCO.

At the invitation of the Society of Rehabilitation of the GDR, Academician of PAN Wiktor Dega participated in the Congress of the Society, held in Dresden on 8-10 October 1975.

Academician of PAN Tadeusz Urbanski took part in the Annual Meeting of Members of the Academy Leopoldina, held in Halle on 9-13 October 1975.

In festivities for the 250th anniversary of the USSR Academy of Sciences that took place on 6-16 October 1975 in Moscow the following Polish scientists

participated: the President of PAN, Academician of PAN Włodzimierz Trzebiatowski, Scientific Secretary of PAN and Academician of PAN Jan Kaczmarek, Academician of PAN Janusz Groszkowski, Academician of PAN Sylwester Kaliski, Academician of PAN Kazimierz Kuratowski, Academician of PAN Witold Nowacki, Academician of PAN Dionizy Smolenski, Academician of PAN Jan Szczepanski, Academician of PAN Bogusława Jezowska-Trzebiatowska, and Corresponding Member of PAN Jan Rychlewski.

The delegation of PAN headed by Academician Stefan Kieniewicz participated in the Third Session of the Polish-Bulgarian Historic Commission held in Sofia on 21-23 October 1975 and devoted to the subject of "The Peasants' Problem and People's Movement in Central and South-Eastern Europe at the End of the 19th and at the Beginning of the 20th Century."

Corresponding Member of PAN Bogdan Baranowski took part in the Meeting of the Chairmen of Chemical Societies and in the Congress of the Spanish Physicochemical Society which were held on 26 October 1975 in Alicante.

A delegation of the Department of Medical Sciences of PAN was in Moscow on 27-30 October 1975 to sign the Protocol on Cooperation for 1976-1980 with the USSR Academy of Medical Sciences. The delegation included Corresponding Member of PAN Jan Kostrzewski, Corresponding Member of PAN Mirosław Mossakowski, Corresponding Member of PAN Antoni Horst.

Corresponding Member of PAN Lech Wojtczak participated in the International Symposium on Energy Interconversion in Biomembranes that was held on 13-16 October in Halle.

Academician of PAN Kornel Gibinski took part in the International Conference of Medical Consultants of the Pharmaceutical Industry, held in Florence on 12-15 October 1975.

Corresponding Member of PAN Witold Okon participated in the Conference of UNESCO on the subject "Les incidences d'une education globale et permanente sur les objectifs et les contenus de l'education scolaire," held in Paris on 20-25 October 1975.

Vice President of PAN, Academician Witold Nowacki traveled on 21 October 1975 to Belgrade, where at the invitation of the local University he delivered a series of lectures.

At the invitation of the University of Waterloo, Academician of PAN Jan Mikusinski traveled on 23 October 1975 to Canada, where he delivered a series of lectures on "Convergence and Locally Convex Spaces, Convergence in Integration Theorem, On the Diagonal Theorem, A Lemma on Convergence and Its Applications, A Kernel Theorem for Kothe Space."

Corresponding Member of PAN Czesław Olech took part in the Conference on Mathematical Optimization, organized by the Ilmenau Polytechnic on 24-28 October 1975.

Academician of PAN Wladyslaw Fiszdon participated in the Meeting of the Congress Committee of the International Union of Pure and Applied Mechanics, held in Delft on 24-25 October 1975.

At the invitation of the Pharmaceutical Society of GDR, Academician of PAN Boguslaw Bobranski took part in the Symposium entitled "Synthesis, Biochemistry and Action of Potent Drugs," held on 3-5 November in Warnemunde, at which he delivered a plenary lecture entitled "Neuere Entwicklung der Chemie von Barbitursaeuren."

Academician of PAN Wlodzimierz Michajlow participated in the International Congress of Scientists on Human Environment, held on 16-26 November 1975 in Kyoto.

Corresponding Member of PAN Antoni Rutkowski took part in the 18th Conference of the FAO devoted to the appraisal of the actual situation in worldwide agriculture and nutrition, held in Rome on 18-20 November 1975.

Corresponding Member of PAN Jerzy Haber participated in the International Conference on Electron Spectroscopy, held in Reinhardsbrunn (GDR) on 18-22 November 1975, at which he delivered a plenary report entitled "Electron Spectroscopy Surface Chemistry."

Academician of PAN Witold Hensel and Academician of PAN Tadeusz Urbanski participated in the "Meeting of the Polish-Italian Interdisciplinary Working Group of Applied Sciences in Archeology and Protection of National Patrimony" which was held in Syracuse and Rome on 19-27 November 1975.

Academician of PAN Jerzy Litwiniszyn traveled on 18 November 1975 to Italy where, in the framework of the exchange of professors between PAN and the Consiglio Nazionale delle Ricerche, he delivered a series of lectures from the domain of the mechanics of orogen.

A PAN delegation headed by Tadeusz Orlowski visited Ulan Bator on 22-26 November 1975 to sign the Protocol on Scientific Cooperation Between the Polish Academy of Sciences and the Academy of Sciences of the Mongolian People's Republic for the years 1976-1980.

Director of the Institute of Legal Sciences of PAN, Prof Dr Adam Lopatka and Prof Dr Tadeusz Jedruszczak of the Institute of History of PAN participated in the Conference on "Conditions of National Independence in the Modern World," organized on 21-23 November 1975 in Paris by the Institut de Gaulle. Professor Lopatka delivered a lecture entitled "Political Conditions of the Exercise of National Independence," and Professor Jedruszczak read a report entitled "The Problems Connected With the Independence of Poland in the Polish Historiography of the 20th Century."

Academician of PAN Adam Bielanski, at the invitation of the University of Neuchatel, delivered on 23-29 November 1975 lectures on Heterogeneous Catalysis at the Universities of Lausanne and Neuchatel.



Corresponding Member of PAN Alfred Jahn participated in the Symposium on Geomorphological Conditions of the Environment of the Tropical Zone, held on 23-31 October 1975 in Lubumbashi (Zaire) and Abidjan (Ivory Coast).

Academician of PAN Michal Smialowski presided over the group of Polish scientists at a Symposium entitled "The Corrosion Cracking and Hydrogen Embrittlement," held in Dresden on 25-29 November 1975.

Academician of PAN Bogdan Suchodolski participated in the Meeting of the Board of the Scientific Council of the Institute of Education of UNESCO, held in Hamburg on 28-30 November 1975.

Corresponding Member of PAN Anatol Brzoza took part in the Demographical-Nutritional Symposium organized on 1-4 December 1975 in Rome by the International Society of Agricultural Economists.

The 18th Session of the Polish-Czechoslovak Historical Commission devoted to the subject of "Marxism, Historiography and Historical Consciousness," at which the Polish Delegation was headed by Academician of PAN Gerard Labuda, was held in Brno on 1-4 December 1975.

Academician of PAN Ignacy Malecki took part in the Meeting of the Advisory Commission of UNESCO on Consequences of Technical Progress, held in Paris on 2-5 December 1975. Malecki delivered a lecture devoted to the assumptions of the UNESCO Program entitled "Science--Society."

Academician of PAN Stanislaw Leszczycki, Academician of PAN Mieczyslaw Klimaszewski and Corresponding Member of PAN Jerzy Kostrowicki participated in the Sixth Congress of the Geographical Society of the USSR, which was held in Tbilisi on 7-14 December 1975. Professor Leszczycki delivered a lecture entitled: Problems of the Protection of the Environment in Spatial Planning.

Academician of PAN Kazimierz Kopecki took part in the Round-Table Discussion devoted to the Basic Scientific and Technical Problems of the Energy, organized by UNESCO in Paris on 8-12 December 1975.

Academician of PAN Zofia Kielan-Jaworowska participated in the festivities of the 800th anniversary of the University of Modena. The Polish scientist delivered at the Paleontological Institute a lecture on Tertiary Mammalians, and on 12 December 1975 she received a diploma of doctorate honoris causa conferred by the University of Modena upon Academician of PAN Roman Kozlowski.

#### Research Achievements

##### Technology of the Production of Al-Fe Sheets for Ultrasonic Converters

The production of thin Al-Fe sheets according to technology developed by the Institute of Physics of PAN in Warsaw (team under the leadership of Docent Dr hab. Zbigniew Kaczkowski) and in the Institute of Iron Metallurgy in Gliwice (team under the leadership of Dr Engr Jadwiga Lassota) was begun last

year under the direction of Senior Technologist Engr Marian Tomczyk, M.A., in the Experimental-Production Metallurgical Plant of Huta Baildon--Mikrohuta in Strzemieszyce.

Research work conducted within the framework of the key problem lasted several years. As a result of it the technology was developed of the production and thermal treatment of Al-Fe sheets from the alloy of aluminum and iron with thicknesses below 0.3 mm. The cost of a ton of Al-Fe sheets manufactured is about seven times less than the cost of a ton of material of similar chemical composition imported from abroad.

Thanks to this technology, one may manufacture from Al-Fe sheets the Al-Fe cores of ultrasonic converters in the range of frequencies up to 90 kHz and it is exactly these very converters which were developed at the Institute of Physics of PAN. Those are the first in the country, prototypes of converters utilizing the alloy of iron and aluminum, which can work at frequencies of 22, 27, 33, 44, 55, 77, and 88 kHz. Thanks to the great advantages of the Al-Fe alloy, among other things, its great electrical resistance and a lesser consumption of electrical energy, the ultrasonic Al-Fe converters find application in various technological equipment. For example, we may quote, among other things, devices used: for cleaning and washing tiny metallic elements, medical instruments, welding and joining plastic elements, treatment of hard and brittle materials (for example, glass and diamonds), and acceleration of chemical processes, as well as in ultrasonic medical equipment and in radio electronics.

A part of these developments is being protected by patents.

In the construction of this type of converters the unremunerative nickel is being widely used up to now. Converters manufactured from it usually work at frequencies of 20 kHz. In the case of more precise devices, special alloys are sometimes used which contain rare and costly elements and, in this case too, these converters work most often at frequencies below 30 kHz.

Models of devices which use in their design the ultrasonic Al-Fe converters were positively appraised by many interested scientific institutions, as well as by production enterprises.

#### New Construction of Polyester Materials

In the Department of Polymers of PAN in Zabrze (team under the direction of Prof Dr Zbigniew Jedlinski) a new technology has been developed for the production of construction materials characterized by high mechanical resistance, resistance to chemicals and phonoinsulation properties, based on the use of chemo- and thermo-resistant polyester resins (patent PRL No 57016).

These materials are used, among other things, for the manufacture of containers for petrochemicals and petroleum products in the Plant for the Construction of Chemical Equipment "Metalchem" in Torun, in the motorization industry (for example, as a shield for engines in the driver's cab), and for building installations and chimneys exposed to the action of aggressive exhaust gases.

Laboratory research carried out in the Department of Polymers of PAN in Zabrze, --at consumers', as well as at producer's,--in the Plant for the Construction of Chemical Equipment "Metalchem" in Torun, showed complete suitability of the original Polish plastic and even its superiority over the material hitherto imported for this purpose from capitalist countries.

In the years 1977-1978 and subsequent years it is planned to use this plastic on a large scale also in the construction, for example, of pipelines, containers, for communal purposes, as well as for many other uses in industrial construction (for example, for building containers and pipelines in the paper industry, food engineering, refineries, etc).

When specially prepared, these sort of plastics (laminates) are characterized by good phonoinsulation and thermomechanical resistance, which permits us to use them for insulating movable parts of machines and installations. Good phonoinsulating properties were obtained thanks to the use of a special composition (elaborated by Engr G. Podgorski, M.A., Engr J. Terlikiewicz, M.A., and Engr A. Kudas, M.A.). In view of the often-occurring problem of the close contact of laminates with the heated parts of machinery (for example, in the case of shielding automobile engines), production was based on a heat-resistant polyester resin, thanks to which it is possible to use them for work at temperatures of the order of 100-120° C. At the special request of consumers, laminates may be also produced as self-extinguishing products.

Technical tests of the new plastic material applied in the production of shields for engines of STAR A-200 trucks, carried out in the Truck Plant in Starachowice, proved favorable. In the future one may envisage the use of this new material for building engine shields, also in other automobiles and phonoinsulating shields for movable parts of machines and equipment.

The use of new construction solutions based on the new type of Polish plastic will ensure considerable operational advantages and economical profits.

Working in the Roof of the Ore Deposit in the Protecting Pillar of the "Gilow" Reservoir

A team composed of scientists and engineers of the "Cuprum" Research and Planning Copper Plants in Wroclaw and of the Institute of Hydraulic Engineering of PAN in Gdansk developed in 1975 a plan for the roof-cave-in mining of the copper ore deposit in the protecting pillar of the "Gilow" reservoir barrage in the area between pits Lubin Central and Lubin West.

The plan was worked out by mining specialists under the leadership of Docent Dr Kazimierz Franasik and by specialists in hydraulic engineering under the guidance of Prof Engr Rudolf Molisz, M.A. It determines the conditions of working the deposit, with the roof cave-in, while ensuring the safety of the "Gilow" reservoir of postflotation waste and related facilities situated in the area of anticipated mining damage.

In the part devoted to mining problems, the plan comprises, among other things, the program of mining with the roof-cave-in, results of observation of deformation of the surface of the site under the effect of the mining heretofore, and the prognosis of deformation of the site due to the mining being planned.

In the domain of hydraulic engineering, analysis was effected of the state of stress and strain in the barrage body upon assuming boundary conditions from the prognosis of the terrain deformation, preliminary laboratory investigations of bottom sediments deposited in the reservoir, and the analysis of the barrage stability. Moreover, to ensure safety, conditions were determined which should prevail on the barrage and in the reservoir during the mining of the deposit in the protecting pillar, and a program was worked out for the observation and control inspection of the reservoir.

According to a preliminary estimate, the mining of the deposit with the roof-cave-in in the protective pillar of the "Gilow" reservoir, beside the fact of obtaining the extra ore, will make it possible to achieve a considerable economic effect.

#### New Tests of Optimization of Dosage of Mutagenic Agents

In the Department of Plant Genetics of PAN in Poznan--within the framework of the key problem which was coordinated by the Institute of Biochemistry and Biophysics of PAN (team under the leadership of Dr hab. Mirosław Maluszynski)--the new tests were worked out for optimization of the dosage of mutagenic agents. The accurately determined dosage permits the achievement of the high mutation frequency (increase of the possibility of mutation permits the obtaining of the starting material for getting new varieties), which substantially increases the profitability of mutational breeding of the new varieties of cultivated plants.

Methods developed at the Department of Plant Genetics of PAN permit us accurately to determine in a short time the dosage of mutagenic agents under laboratory conditions, taking into account the different sensitivity of individual species, varieties, and even families of cultivated plants. The elaborated tests eliminate the necessity of conducting the protracted and difficult field experiments practiced heretofore.

Thanks to the application of the new tests, there were determined for various species of cultivated plants dosages and methods of "treatment" with chemical mutagens which permitted the achievement of over twofold higher frequency of mutants.

The newly developed methods also permitted the carrying out on a wide scale of the mutation of many species of cultivated plants for the use of plant breeding stations.

In the Department of Plant Genetics of PAN, thanks to the application of new methods, numerous new forms of cultivated plants were obtained which exhibited better useful characteristics.

The mutability thus achieved in the summer barley (cooperation with the Station of Plant Breeding of the Plant Cultivation Union of Polanowice-Lagiewniki) related to such characteristics as the increase of cropping power, the change in the protein content in caryopsis from 8 to 21 percent, the increase of layering, decrease in plant height, resistance to powdery mildew, and resistance to lodging. There were also obtained morphological mutants of tomato (in cooperation with the Swietoslaw Breeding Station of Horticultural Plants) which permit us to introduce genetic analysis of characteristics important from the economic viewpoint.

#### International Monograph on Automation

In a group of very valuable and authoritative works, there appeared an international monograph entitled "Trends in Control Components." The initiator of this monograph, and at the same time the editor and coauthor, is Academician of PAN Maciej Nalecz, who is on the Board of the International Federation of Automatic Control IFAC.

The aim of the monograph on automation, of international scope, was to accumulate the scientific results of the most important research centers and individual scientists in this new dynamically developing field of science of great economic importance.

Nineteen scientists from eight countries, viz, England, Spain, Japan, GDR, Poland, Sweden, USA, and USSR, are the authors of the monograph, which is published within the framework of the Library of Monographs of the International Federation of Automatic Control IFAC.

The book was published in English by North-Holland-American Elsevier and comprises of 14 chapters (totaling 408 pages). Two chapters are devoted to miniaturization of electronic and magnetic elements, three chapters relate to electronic and hydraulic elements, and the rest concern the application of galvanomagnetic, optical and microwave phenomena in the structure of automation elements. The last chapter concerns the biological receptors and their technical models.

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POLISH ACADEMY OF SCIENCES ACTIVITIES, PERSONNEL

Warsaw NAUKA POLSKA in Polish No 6 Jun 76 pp 107-122

[Excerpts] Symposium on Educational Cybernetics

The Fourth All-Polish Symposium of Educational Cybernetics was held in Krakow on 19-20 January 1976 during which 50 specialists discussed the problems of modeling educational processes, that is, the creation of ideal standards. This is of special importance in view of the present reform of the educational system.

The modeling comprises the structure of the entire educational system, the control of it and of individual educational units, as well as individual activities connected with education. Teaching machines can teach as well as check the knowledge of students. They adapt their pace of teaching to individual aptitudes, are more objective, and accumulate comparative data from the results of exams.

By means of teaching machines, which are already used in Poland in several schools, it is easier to effect the so-called structuralization of the content of basic elements of knowledge and elimination of information of marginal importance.

The Problem of Flammability of Polymers

The First All-Polish Symposium devoted to ways of decreasing the flammability of polymers and plastics, was held on 8-9 January 1976 in Lodz. It was organized by the Center of Molecular and Macromolecular Research of the Polish Academy of Sciences (PAN) in Lodz. A total of 75 scientists from 27 industrial institutes and higher educational institutions from the entire country participated.

Application of Mathematics and Information Science

The Fifth All-Polish Symposium devoted to problems of mathematic and computer methods in geology was held on 28-30 January 1976 in Krakow. In addition to geologists--miners, mathematicians, physicists, and astronomers also participated.

It was stressed by the participants that mathematical methods and information science permit the geologists to faster and more accurately locate and define deposits of minerals and lead to a more rapid and safer exploitation of these deposits.

#### Dependability of Machines and Equipment

The Team of Dependability of the Section of Principles of the Exploitation of Machines of the Committee of Machine Building of PAN organized, on 12-17 January 1976 in Jaszowiec, a symposium on the subject "The Problems of the Ensurance of Dependability of the Technical Systems at Stages of Designing, Construction and Exploitation." These symposiums are organized annually (since 1972) with the cooperation of the Center of Technical Progress in Katowice. They were devoted: in 1972, to selected problems of dependability of technical equipment; in 1973, to methods of testing dependability of mechanical equipment; in 1974, to problems of shortening the time of dependability testings; and in 1975, to simulation methods of testing dependability of technical systems.

The symposium in Jaszowiec was attended by scientific research and scientific educational workers from higher educational institutions and scientific research units currently conducting research concerning dependability of machines and equipment.

The Team of Dependability deals in the first place with problems concerning the ensurance of adequate quality and dependability at stages of designing, construction and exploitation of machines. Symposiums organized by the Team of Dependability produced concrete results in the field of generalization and introduction into scientific investigations and industry of methods of checking dependability.

The Committee of Machinebuilding of PAN devotes particular attention to the training and supplementary training of scientific cadres mainly in the domain of systematic and constant enhancement of the level of the quality and dependability of technical equipment.

#### Plant Protection

The Poznan Institute of Plant Protection organized on 12-14 February 1976, in Poznan, the International Scientific Session on the subject of problems connected with plant protection. Several hundred specialists from the entire country, as well as representatives from Austria, Czechoslovakia, France, the GDR, FRG, United States, Switzerland, Hungary and Great Britain participated in it.

A considerable part of the reports of the participants was devoted to problems of the resistance of plants to agents causing diseases, viruses, bacteria and fungi; to new methods of plant protection, for example, biological and chemical; to the application of various means of protection against pests; to new methods of investigation with the use of electronic computing technology; to prognosis and signalizing the appearance of diseases, plant pests and weeds; and to the possibility of the use of aerial photography.

## Vaccine Against Lungworm Infection of Sheep

In the Department of Parasitology of PAN investigations were conducted under the leadership of Dr Marian Swietlikowski aimed at combatting a dangerous disease of sheep--the lungworm. This is a grazing disease causing great damage to animal husbandry in Poland and in other countries of Europe and Asia. The results obtained consist, among other things, of the elaboration of a new preventive vaccine against lungworm, along with the technology of its production, which required almost 5 years of work to develop.

Investigations on the immunization of sheep with vaccine developed in the Department of Parasitology of PAN gave positive results. On-site investigations in the production flocks composed of lambs and adult sheep carried out in the past years on state agricultural farms have shown that the vaccine produces almost a 100 percent immunization against lungworm.

The results of these investigations have not as yet been utilized on a large scale because of the comparatively small size of the sheep husbandry in Poland. A considerable increase in the sheep population (in 1976-1980 a twofold increase in the population of sheep is envisaged) will require immunization of sheep against lungworm nematodes.

## Lectures at the University of PAN

In the academic year 1975/1976, in the winter-spring semester within the framework of the cycle of lectures organized by the University of Polish Academy of Sciences, Polish scientists delivered the following lectures:

Inaugural lecture--by Academician of PAN Wlodzimierz Michajlow--Topical Problems of Generalization of Science;

In the Humanities Section: Academician of PAN Wladyslaw Tatarkiewicz--On Perfection; Corresponding Member of PAN Jerzy Topolski--Basic Problems of Methodology of History; Academician of PAN Witold Hensel and Docent Dr hab. Stanislaw Tabaczynski--Neolithic Revolution and Its Importance for the Development of European Culture; Academician of PAN Stefan Zolkiewski--On Recent Theories of Culture of the 20th Century; Corresponding Member of PAN Wincenty Okon--Changes in the Modern School; Prof Czeslaw Madajczyk--European Culture and Fascism;

In the Technical Section: Prof Zbigniew Wesolowski--Propagation of Waves in Nonlinear Elastic Media; Corresponding Member of PAN Jan Rychlewski--Mathematical Theory of Dimensions and Similarities; Prof Marek Sokolowski--Foundations of Mechanics of the Destruction of Materials; Corresponding Member of PAN Jan Madejski--Problems of Heat Exchange and Hydromechanics in the Domain of Plasma Spraying; Corresponding Member of PAN Witold Rosinski--Implantation of Ions in Scientific and Technical Investigations; Prof Andrzej Ziabicki--Structure and Properties of Polymers; Docent, Dr hab. Dominik Rogula--Foundations of Nonlocal Theory of Material Media;



In the Natural History Section: Academician of PAN Bernard Zablocki--Immunology, A Review of Topical Problems; Academician of PAN Wladyslaw Jasinski--Application of Atomic Energy in Medicine; Prof Wojciech Zielenkiewicz--Dynamic Microcalorimetry; Prof Elzbieta Fonberg--On Physiological Mechanisms on Experimental Neurosis and Emotional Disturbances in Animals; Corresponding Member of PAN Witold Michalkiewicz--Development of the Study of Reproduction in Man;

In the Cycle of Man and Environment: Wlodzimierz Michajlow--Environment and Politics; Prof Wacław Brzezinski--Legal Problems of Environmental Protection; Docent Dr hab. Barbara Prandecka--Economic Processes and Action and Environmental Protection; Dr Tomasz Kocan--Protection of the Resources and Quality of Inland Waters as Basic Element of Protection of Man's Environment; Academician of PAN Bohdan Dobrzanski--Modern Agriculture and Problems of Environment; Prof Tadeusz Skawina--Problems of the Recultivation of Soil Areas Transformed by Industry; Docent Dr hab. Andrzej Grebecki--Problems of Man's Environment and Biology in Developing Countries; Docent Dr hab. Franciszek Mleczko--Social Problems of Environmental Protection; Corresponding Member of PAN Piotr Zaremba--Problems of Urbanization and Environmental Protection; Prof Jan Juda--Technical Problems in the Protection of Atmospheric Air; Prof Kazimierz Dziewonski--Rational Use and Protection of Resources of Natural Environment: Methods, Analyses and Applications.

#### Donation of Mathematical Works to Vietnam

A ceremony of the transfer of books and works of Polish mathematicians, donated to Vietnam, to the First Secretary of the Embassy of Vietnam, Dao Van Nham, took place at the Institute of Mathematics of PAN on 10 December 1975. These books will replenish the destroyed university libraries in Vietnam.

The ceremony was attended by the First Deputy Scientific Secretary of PAN, Academician of PAN Tadeusz Orłowski, and by the heads of the Institute of Mathematics, including Academician of PAN Kazimierz Kuratowski and Corresponding Member of PAN Czesław Olech.

#### A New Periodical--NAUTOLOGIA [Nautology]

A new periodical of the Polish Nautological Society, NAUTOLOGIA, was published at the end of the first quarter of 1976 at the direction of the Department of Science, Education and Technology of PAN, by the Gdansk Section of Publications of the Ossolinski National Institution.

The periodical is intended, not only for scientific workers, but also for students of secondary schools and students of higher marine schools, as well as for seagoing people and for persons interested in scientific problems of the development of our marine economy. As a matter of fact, the publication will include articles and materials from the domain of social and humanistic sciences connected with marine economy, especially dealing with such problems as the history of Polish and world navigation, shipbuilding, ports and hydraulic engineering, marine sociology, that is, matters related to the mariners,

education and marine medicine, marine law, nautics, underwater archeology, ethnography of seagoing peoples, marine museums, as well as materials and original works and essays from Polish and world seascape painting.

Besides the section of articles and essays, the periodical will contain a section of reviews and information about novel publications from scientific and esthetic literature, as well as the chronicle of actual events connected with marine economy. Moreover, there will be reprinted unique archival items relating to marine matters.

The periodical contains resumes of articles in English.

#### Scientific Publications

A book was published in English by Academician of PAN Witold Nowacki entitled "Dynamic Problems of Thermoelasticity" (PWN, Leyden: Nordhoff International Publishing, 1975, 436 pp).

This comprehensive work is devoted to problems of the so-called "compressed" thermoelasticity, a theory uniting into a single whole the theory of thermal conduction on the common basis of thermodynamics of irreversible processes. A bibliography completes the content of the book.

"Implantation of Ions" is a monograph by Corresponding Member of PAN Witold Rosinski (PWN, Warsaw, 1975, 239 pp) in which the author deals with the technology of implantation, the theory of ion deceleration in a crystallographic lattice, radiation damage, methods of investigation of radiation damage, and application of ion implantation to production of semiconductors.

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